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Generation of forebrain neurons from human embryonic stem cells

**Grant Award Details**

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Generation of forebrain neurons from human embryonic stem cells

**Grant Type:** SEED Grant

**Grant Number:** RS1-00205

**Investigator:**

**Name:** Anirvan Ghosh  
**Institution:** University of California, San Diego  
**Type:** PI

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**Disease Focus:** Aging, Alzheimer's Disease, Neurological Disorders

**Human Stem Cell Use:** Embryonic Stem Cell

**Award Value:** \$587,591

**Status:** Closed

**Progress Reports**

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**Reporting Period:** Year 2

**View Report**

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**Grant Application Details**

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**Application Title:** Generation of forebrain neurons from human embryonic stem cells

**Public Abstract:**

The goal of this proposal is to generate forebrain neurons from human embryonic stem cells. Our general strategy is to sequentially expose ES cells to signals that lead to differentiation along a neuronal lineage, and to select for cells that display characteristics of forebrain neurons. These cells would then be used in transplantation experiments to determine if they are able to make synaptic connections with host neurons. If successful these experiments would provide a therapeutic strategy for the treatment of Alzheimer's disease and other disorders that are characterized by loss of forebrain neurons. Currently there is no effective treatments for Alzheimer's disease, and with an aging baby-boomer population, the incidence of this disease is likely to increase sharply. One of the few promising avenues to treat Alzheimer's is the possibility of cell replacement therapy in which the neurons lost could be replaced by transplanted neurons. Embryonic stem cells, which have the ability to differentiate into various cells of the body, could be a key component of such a therapy if we can successfully differentiate them into forebrain neurons.

**Statement of Benefit to California:**

Alzheimer's disease is a devastating sporadic neurological disorder that places all of us at risk. As the California population ages, there will be a significant increase in the incidence of Alzheimer's disease, and the medical and financial cost on the state will be severe. There are currently no effective treatments for this disorder, and one of the few promises is the possibility of transplantation therapy to replace the neurons that are lost in the disease. Being able to generate forebrain neurons from human embryonic stem cells would provide a key tool in the fight against this disease. Needless to say, the development of an effective cell replacement therapy would not only be of immense medical significance as we care for our senior population, it will also greatly relieve the financial burden associated with the care of Alzheimer's patients, which is often borne by the state.

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